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WHAT IS CLAIMED IS:

- 1 1. An electrosurgical instrument for use with a robotic arm, the
2 instrument comprising:
3 a body;
4 a wrist body that is rotatably coupled to the body about a first axis;
5 a pair of opposed end effectors rotatably coupled to the wrist about a second
6 axis, wherein the pair of end effectors being movable between an open position and a closed
7 position;
8 a first electrode coupled to one of the end effectors; and
9 a second electrode coupled to one of the end effectors, wherein the first and
10 second electrodes are in a spaced configuration when the end effectors are in the closed
11 position.
- 1 2. The electrosurgical instrument of claim 1 further comprising an
2 actuating device to move the pair of end effectors between the open and closed position.
- 1 3. The electrosurgical instrument of claim 2 wherein the actuating device
2 comprises drive member(s) and pulley(s).
- 1 4. The electrosurgical instrument of claim 3 further comprising a robotic
2 interface attached to the body for interfacing with a robotic manipulator assembly.
- 1 5. The electrosurgical instrument of claim 1 comprising first and second
2 conductive leads that are coupleable to the first and second electrodes to a power source.
- 1 6. The electrosurgical instrument of claim 5, wherein the conductive
2 leads extend through lumens in the body and wrist
- 1 7. The electrosurgical instrument of claim 5 wherein first and second
2 conductive leads electrically connect the electrosurgical power source to the electrodes,
3 wherein at least one of the conductive leads is removably attachable to the corresponding
4 electrode.
- 1 8. The electrosurgical instrument of claim 1 wherein the pair of end
2 effectors comprise a corresponding pair of jaws including a corresponding pair of opposed,

3 conductive grip surfaces, the jaws being arranged so that the respective grip surfaces are
4 adjacent one another when the end effector is in the closed position.

1 9. The electrosurgical instrument of claim 8, wherein the jaws comprise a
2 conductive material, and each jaw is coupled to the instrument by mounting to a
3 corresponding non-conductive pulley member.

1 10. The electrocurgical instrument of claim 9, wherein the jaws are
2 replacably removably mounted from the end effectors mounted to the pulley members.

1 11. The electrosurgical instrument of claim 1 wherein the electrodes are
2 substantially planar.

1 12. The electrosurgical instrument of claim 1 wherein the second axis is
2 substantially orthogonal to the first axis.

1 13. The electrosurgical instrument of claim 1 wherein the body defines a
2 longitudinal axis that is substantially orthogonal to the first axis, wherein the wrist and end
3 effectors are rotatable about the longitudinal axis

1 14. The electrosurgical instrument of claim 1 wherein the pair of end
2 effectors are composed of a non-conductive material.

1 15. The electrosurgical instrument of claim 1 wherein the first and second
2 electrodes are elongate.

1 16. The electrosurgical instrument of claim 1 wherein the electrodes in the
2 closed position are spaced by a distance between approximately 0.01 inches and 0.10 inches.

1 17. The electrosurgical instrument of claim 1 wherein the first electrode is
2 positioned within a groove and the second electrode is positioned on a boss.

1 18. The electrosurgical instrument of claim 1 wherein the first and second
2 electrode are both disposed on the first end effector.

1 19. The electrosurgical instrument of claim 1 wherein the first and second
2 electrodes are disposed on opposing end effectors.

1 20. The electrosurgical instrument of claim 1 wherein the first and second
2 end effectors do not penetrate the tissue.

1 21. The electrosurgical instrument of claim 1 further comprising at least
2 one nonconductive sleeve disposed over at least one of the end effectors, wherein at least one
3 of the first and second electrodes are coupled to the end effectors through the nonconductive
4 sleeves.

1 22. The electrosurgical instrument of claim 21, wherein the sleeves are and
2 electrodes are replacably removable from the end effectors.

1 23. A method of treating tissue, the method comprising:
2 providing a first end effector and a second end effector, the first and second
3 end effectors having a first electrode in a groove and a second electrode on a boss;
4 gripping the tissue between the first and second end effectors;
5 applying a current to the first and second electrodes to cauterize the tissue.

1 24. The method of claim 20 further comprising tensioning the tissue to cut
2 the tissue.

1 25. The method of claim 23 wherein gripping comprises rotating the first
2 end effector and second end effector about at least two axes.

1 26. The method of claim 23 wherein gripping comprises robotically
2 actuating grip drive members of the first and second end effector.

1 27. The method of claim 26 wherein applying comprises delivering a
2 current from an electrosurgical generator through the drive members.

1 28. The method of claim 23 wherein gripping comprises interdigitating the
2 first and second end effectors, wherein the first and second electrodes are spaced between
3 approximately 0.01 inches and 0.10 inches.

1 29. The method of claim 23 wherein the first electrode is positioned on the
2 first end effector and the second electrode is positioned on the second end effector.

1 30. The method of claim 23 wherein the first electrode and second
2 electrode are positioned on the first end effector.

1 31. The method of claim 23 wherein gripping comprises interdigitating the
2 first and second end effectors.

1 32. The method of claim 31 wherein interdigitating comprises tensioning
2 the tissue gripped between the end effectors.

1 33. The method of claim 23 wherein the current is less than 1 amp.

1 34. The method of claim 23 further comprising coupling the end effectors
2 to a robotic manipulator.

1 35. An electrosurgical tool for use with a robotic surgery system, the tool
2 comprising:

3 a body comprising a proximal portion and a distal portion, wherein the
4 proximal portion comprises an interface for coupling to a robotic manipulator assembly;
5 a first and second opposing grips rotatably coupled to the distal portion of the
6 body;

7 nonconductive sleeves disposed over the opposing grips;

8 a first and second electrode disposed on the nonconductive sleeves;

9 conductive leads that connect the first and second electrodes to an

10 electrosurgical power source; and

11 an actuation mechanism coupled to the first and second grips to move the first
12 and second grips between an open position and a closed position.

1 36. The electrosurgical tool of claim 35 wherein the grips are coupled to
2 the body through a rotatable wrist.

1 37. The electrosurgical tool of claim 35 wherein the grips in the closed
2 configuration positions the first and second electrode in a spaced configuration.

1 38. The electrosurgical tool of claim 37 the spaced configuration of the
2 first and second electrode provides cauterization and cutting of a tissue engaged by the first
3 and second grips.

1 39. The electrosurgical tool of claim 35 wherein the conductors are at least
2 partially disposed outside of the body.

1 40. The electrosurgical tool of claim 35 wherein the electrodes are offset
2 when the grips are in the closed position.

1 41. The electrosurgical tool of claim 35 wherein the actuation mechanism
2 comprises a pulley assembly and at least one drive cable.

1 42. A method of cauterizing tissue, the method comprising:
2 coupling nonconductive sleeves over a pair of end effectors;
3 gripping the tissue with the end effector; and
4 delivering a current through electrodes disposed on the sleeves to cauterize the
5 gripped tissue.

1 43. The method of claim 42 comprising electrically coupling the electrodes
2 to an electrosurgical power source through conductive leads.

1 44. The method of claim 43 wherein gripping comprises robotically
2 actuating the pair of grips.

1 45. The method of claim 42 comprising tensioning the gripped tissue to
2 sever the cauterized tissue.

1 46. The method of claim 42 wherein the electrodes comprise first and
2 second electrodes, wherein the first electrode is disposed on a boss and the second electrode
3 is disposed in a groove, the method further comprising interdigitating the first and second
4 electrodes.

1 47. The method of claim 42 wherein the electrodes comprise first and
2 second electrodes, the method further comprising offsetting the first and second electrodes to
3 prevent shorting.

1 48. A robotic surgical system comprising:
2 a base;
3 at least one robotic arm movably coupled to the base;
4 an input device configured to control the robotic arm;

5 a robotic manipulator assembly coupled to the robotic arm and input device;
6 a surgical instrument coupled to the robotic manipulator assembly, wherein
7 the surgical instrument comprises a shaft, a pair of opposed grips that are moveable between
8 an open position and a closed position, and first and second electrodes coupled to the grips,
9 wherein the grips in the closed position maintain a spacing between the first and second
10 electrodes.

1 49. The robotic surgical system of claim 48 wherein the electrodes are
2 coupled to the grips through nonconductive sleeves that can fit over the grips.

1 50. The robotic surgical system of claim 48 wherein the first electrode is
2 disposed in a groove and the second electrode is disposed on a boss.

1 51. The robotic surgical system of claim 48 further comprising an
2 electrosurgical power supply that is coupled to the electrodes.

1 52. The robotic surgical system of claim 48 wherein the surgical
2 instrument further comprises an actuation device that couples the grips to the robotic
3 manipulator assembly.

1 53. The robotic surgical system of claim 48 wherein the surgical
2 instrument comprises a wrist, wherein the grips are rotatably coupled to the shaft with the
3 wrist.

1 54. A electrosurgical cauterizer comprising:
2 a body;
3 a pair of opposed grips rotatably coupled to the body;
4 first and second electrodes coupled to one of the grips; and
5 drive members coupled to the pair of grips to move the grips between an open
6 position and a closed position, wherein the drive members electrically couple the first and
7 second electrodes to a power supply.

1 55. The cauterizer of claim 54 wherein the drive cables are at least
2 partially insulated.

1 56. The cauterizer of claim 54 further comprising pulleys, wherein the
2 drive members run over the pulleys.

1 57. The cauterizer of claim 54 wherein at least one of the pulleys and grips
2 are insulated.

1 58. The cauterizer of claim 54 wherein the first electrode is disposed on a
2 boss and the second electrode is disposed in a groove.

1 59. The cauterizer of claim 54 wherein at least one of the grips includes a
2 cutting device.

1 60. A electrosurgical cauterizer for manipulation by a robotic surgical
2 system, the cauterizer comprising:

3 a body;

4 a clevis rotatably coupled to the body about a first axis;

5 a first and second end effector coupled to the clevis about a second axis,
6 wherein the first and second end effectors comprise:

7 a conductive grip body comprising a proximal portion and a distal
8 portion, wherein the distal portion comprises grip for gripping a target tissue; and

9 nonconductive pulley disposed around the proximal portion of the grip
10 body for insulating the first end effector from the second end effector;

11 a first conductive lead coupled to the first end effector and a second
12 conductive lead coupled to the second end effector, wherein the first and second leads are
13 attachable to a power source for delivering energy to the distal portions of the first and
14 second end effectors.